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**APPLICATION
FOR
UNITED STATES LETTERS PATENT**

Title: DEVICE FOR SUPPORTING, PADDING, AND
ELEVATING A PIPE OR BAR CLAMP

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DEVICE FOR SUPPORTING, PADDING AND
ELEVATING A PIPE OR BAR CLAMP

Field of the Invention:

The invention pertains to pipe and bar clamps and, more particularly, to a pad support having a non-marring surface for installation on an elongated portion of a pipe or bar clamp to elevate, support, and stabilize the clamp above a work surface.

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BACKGROUND OF THE INVENTION

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Pipe and bar clamps which allow clamping work of relatively large breadth are well known and have been used by generations of woodworkers and other craftsmen. These types of clamps generally have a non-adjustable (i.e., fixed) jaw movably positionable along an elongated bar or pipe. A second, adjustable jaw is disposed at the proximal end of the pipe or bar. Typically the adjustable jaw utilizes a screw arrangement to adjustably apply pressure to a work piece placed between the fixed jaw and the adjustable jaw, the tightening of the screw applying greater and greater pressure to the clamped work piece.

Pipe clamps are often supplied in a kit form consisting of the aforementioned fixed jaw and an adjustable jaw. The user supplies one or more lengths of pipe of an appropriate diameter to connect the fixed and adjustable jaws.

5 Typically, the adjustable jaw is attached to the pipe by means of external threads on the end of the pipe which mate with internal threads supplied in the adjustable jaw. The fixed jaw is typically movably positioned at or near the distal end of the pipe and is typically held in place by a
10 friction brake mechanism. Bar clamps, on the other hand, are generally provided in different, fixed lengths and are typically non-extendable.

15 It will be recognized that, using suitable couplers, lengths of pipe may be added until the overall length of the pipe section between the fixed and adjustable jaws is suitable and significant. Because pipe is relatively heavy, sagging of the pipe at points between its proximal and distal ends (i.e., the fixed and adjustable jaws) may be a
20 problem.

Discussion of the Related Art:

25 United States Patent No. 4,858,861 for CLAMP-TYPE PIPE SHOE AND METHOD, issued August 22, 1989 to Joseph Wilkinson, III, teaches a pipe shoe for permanently supporting a length

of insulated pipe. The longitudinal relationship of the WILKINSON III pipe shoe to the insulated pipe it supports is fixed once the clamping sections are closed around the insulated pipe. The pipe clamp padded pad support or supports, hereinafter pad support of the invention, on the other hand, is free to move freely along the pipe of the pipe clamp. WILKINSON III's pipe shoe has a metal base which could scratch or otherwise damage the surface of the work piece upon which it rests. The inventive pad support, however, is designed to carefully control contact with the surface of the work piece to minimize the possibility for damage.

United States Patent No. 5,058,870 for CLAMPING APPARATUS, issued October 22, 1991 to Raymond C. Cetnar, teaches a bar clamp adapted to provide pressure to a work piece from two orthogonal directions. A secondary bar supported on screws located at the proximal and distal ends of the bar may be moved up and down relative to the face of a work piece clamped between the traditional jaws of the bar clamp. The secondary bar has one or more blocks placed between the bottom of the secondary bar and the face of the work piece. These blocks are placed to transmit force from the secondary bar to the face of the work piece as the secondary bar is lowered towards the work piece surface. These blocks, although located between the secondary bar and the surface of the work piece, are not longitudinally

positionable once secondary pressure is applied. The inventive pad supports, however, have no structure designed to transmit a secondary, normal force to the face of a work piece.

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United States Patent No. 5,192,060 for AUXILIARY PRESSURE CLAMP, issued March 9, 1993 to John Novak performs a function similar to the clamp of CETNAR described hereinabove. A pair of slideable, auxiliary, force-applying screws may be positioned along the bar of a clamp for the application of local pressure to the face of a work piece clamped by the main jaws of the bar clamp.

United States Patent No. 5,785,457 for PIPE PLACEMENT AND SUPPORT SYSTEM, issued July 28, 1998 to Thomas G. Thompson et al. provides a series of legs for supporting long lengths of connected pipe sections substantially horizontally over an uneven surface. No clamping function is provided.

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United States Patent No. 6,050,559 for BAR CLAMP FOR WOOD MANUFACTURING, issued April 18, 2000 to Stephen de Sousa, teaches a bar clamp having parallel, longitudinal bars to which interchangeable contacting or attachment bodies may be fitted to configure the clamps for various applications. However, no support structures such as those of the present invention are provided.

None of these patents, either individually or in combination, teaches or suggests the pad support of the present invention.

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SUMMARY OF THE INVENTION

In accordance with the present invention there is provided a pad support for use with a pipe or bar clamp.

10 Pipe clamps are clamps having an elongated member to which a fixed jaw and an adjustable jaw are affixed. The fixed jaw is typically placed at or near a distal end of the pipe or bar while the adjustable jaw is placed at the proximal end.

15 The pad support surrounds the longitudinal, elongated member and may readily be slid therealong to provide support to it above the surface of the work piece held by the clamp.

Optionally, the face of the pad support may be provided with a resilient covering to prevent scratching or marring of the workpiece if the pad support is in contact with the

20 workpiece. Also optionally, a pad support may be provided with a locking mechanism to secure it to the elongated member once in position therealong. The geometry and material are chosen to prevent damage to the surface above which the pipe or bar clamp is positioned.

It is therefore an object of the invention to provide a pad support for use in supporting the pipe or bar clamp above a surface of a clamped work piece.

5 It is another object of the invention to provide a pad support for use in supporting the pipe or bar of a clamp, wherein the pad support may be readily slid along the pipe or bar between the fixed jaw and adjustable jaws of the clamp.

10 It is a further object of the invention to provide a support for use in supporting a the pipe or bar of a clamp, wherein one or more pad supports may be secured along the length of the bar or clamp.

15 It is a still further object of the invention to provide a set of pad supports in stepped sizes to support the pipe or bar clamps different distances above the surface of a work piece.

20 It is yet another object of the invention to provide a set of pad supports having predetermined center hole geometry and size to accommodate bar and pipe clamps of differing bar or pipe dimensions.

25 It is a still further object of the invention to provide a pad support having a soft face made from a

resilient material to prevent scratching or marring a clamped workpiece when the pad support is in contact therewith.

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BRIEF DESCRIPTION OF THE DRAWINGS

A complete understanding of the present invention may be obtained by reference to the accompanying drawings, when considered in conjunction with the subsequent detailed description, in which:

15 FIGURE 1 is a pictorial perspective view of a pipe

clamp having two pad supports disposed thereupon, in accordance with the invention;

FIGURE 2 is a rear elevational view of one embodiment of the pad support of the invention;

20 FIGURE 3 is a front elevational view of a first embodiment of the inventive pad support;

FIGURE 4a is a front elevational view of an alternate embodiment of the inventive pad support;

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FIGURE 4b is a side view of the pad support of FIGURE 4a; and

FIGURE 5 is a side sectional view of the pad support in situ, showing an alternate embodiment of FIGURES 1 and 2 and having means for securing the pad support to the elongated member of the clamp.

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DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention provides a pad support for use
10 with a pipe or bar clamp to support the elongated member (e.g., the pipe or bar of the clamp) at one or more points between the fixed jaw and adjustable jaw of the clamp. In an alternate embodiment of the pad support, a resilient material is provided on the face of the pad support touching
15 the work piece to protect the work piece. Hereinafter, the term pipe is used to refer to either a pipe or bar forming the elongated member of a pipe or bar clamp, respectively.

Referring first to FIGURE 1, there is shown a
20 pictorial, perspective view of a typical pipe clamp, generally at reference number 100. Clamp 100 has an elongated member 102 which may be a pipe having a substantially circular cross-section or bar having a square, rectangular, polygonal, or other cross-sectional shape, not
25 shown.

The fixed jaw 104 is secured to elongated member 102 near a distal end 106 thereof. Fixed jaw 104 is typically releasably secured to elongated member 102 by a frictional engagement mechanism, not shown. Such frictional engagement mechanisms are known to those of skill in the art and form 5 no part of the present invention.

An adjustable jaw 108 is secured to elongated member 102 at the proximal end 110 thereof. When elongated member 10 102 is a pipe, adjustable jaw 108 is typically secured thereto by external threads, not shown, at the proximal end 110 of elongated member 102 which mate with matching internal threads 112 provided in adjustable jaw 108. It will be recognized that when elongated member 102 has a form 15 other than circular, means other than threads must be provided to secure adjustable jaw 108 to the proximal end 110 of elongated member 102.

When a pipe is used as elongated member 102, it is 20 possible to couple additional lengths of pipe to one another using optional couplings 114 to extend elongated member 102 to any required length. Couplings 114 typically have internal threads in each end adapted to receive external threads on the ends of pipe sections being joined thereby. 25 Pad supports 116 in accordance with the invention are disposed along elongated member 102 as shown in FIGURE 1 and described more fully hereinbelow.

Referring now also to FIGURE 2, there is shown a rear elevational view of pad support 116. Pad support 116 has a central opening or aperture 118 sized to loosely accommodate the cross section of elongated member 102 (FIGURE 1) disposed therealong. Pad supports 116 may be positioned at will along the length of elongated member 102. In the embodiment shown in FIGURE 1, two pad supports 116 are shown. It will be recognized that, generally depending upon the length of elongated member 102, any number of pad supports 116 may be placed on elongated member 102 for the support thereof above the surface 132 of a work piece. It will be recognized that if couplings 114 are included, aperture 118 may optionally be sized to slip over the outside thereof.

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In a first embodiment, pad support 116 has a substantially circular hub 122 having aperture 118 located centrally therein. Lobes 120, which each have an arcuate distal periphery 124, radiate outwardly from hub 122 at a predetermined radius 128. When resting as shown in FIGURE 2, there are two points of contact 130 with surface 132 representative of the surface of a clamped work piece, not shown. The two points of contact 130 provided by adjacent ones of lobes 120 provide stability to pad support 116 while making only minimal contact with the surface 132. Three lobes 120 are typically provided. However other numbers of

lobes 120 may be used. Typically, an odd number of lobes 120 has been found preferable for pad supports 116.

Pad supports 116 may be formed from many different materials using many different processes. In a preferred embodiment, pad supports 116 are injection molded from a suitable polymer such as polyethylene, polypropylene, nylon, phenolic, epoxy, DELRIN®, polycarbonate, acrylic, fiber-resin composite materials, PVC, and ABS. It will be recognized that other suitable material may also be used. Consequently, the invention is not considered limited to the material chosen for purposes of disclosure but rather includes any other suitable material.

Ribs 126 may be molded into pad support 116 to provide strength, while minimizing weight and resin cost. Alternately, pad support 116 may be cut or otherwise machined from a solid stock of wood, plastic, or metal. When formed from a polymeric material, either by injection molding or cutting from stock material, pad supports 116 may be made in a distinctive color, for example, international orange or another distinctive color. Such a color helps minimize misplacing pad supports 116 when they are not in use.

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Pad supports 116 may be supplied in a variety of radii 128 to meet various operating requirements. Pad supports

116 may also be marketed in sets of various sizes (i.e.,
differing radii 128) and/or quantities. In addition,
various geometries of aperture 118 and/or sizes may be
supplied to mate with elongated members 102 having differing
5 cross sections, not shown.

Referring now to FIGURES 3 and 4a, there are shown
front, elevational views of two embodiments of pad support
116. The front surface of both embodiments is substantially
10 planar. However, while face 140 of the embodiment of FIGURE
3 is solid, the embodiment of FIGURE 4a has a layer of
resilient material 142 affixed to front surface 140.
Resilient layer 142 may be rubber or another similar
material. A material having good release properties from
15 materials such as glue, adhesive, or other substances with
which face 140 may come in contact with during use is
desirable. Resilient material 142 may be cemented to face
140 or, in alternate embodiments, may actually be applied to
face 140 in a second molding operation. Resilient layer 142
20 provides protection to the work piece with which face 140
may come in clamping contact during use of the pipe clamp
100 (FIGURE 1).

FIGURE 4b shows a cross-sectional view of the
25 embodiment of FIGURE 4a. Resilient material 142 is shown
attached to face 140. Material 142 is inset into face 140,

leaving ridges 144, 146 of base material (i.e., the material from which pad support 116 is formed).

Referring now to FIGURE 5, there is shown a side, cross-sectional view of an alternate embodiment of pad support 116. Pad support 116 may be equipped with a locking mechanism to hold it at a specific point along elongated member 102. This feature can be implemented in a number of ways well known to persons having mechanical design skills.

For example, a concentric hub extension 134 can be attached to pad support 116 proximate aperture 118. Hub extension 134 can have a set screw 136 that, when extended, engages elongated member 102, thereby securing hub extension 134 and, consequently, pad support 116 to elongated member 102.

It will also be recognized by those skilled in the art that pad support 116 can have a number of other regular peripheral geometries such as round, square, hexagonal, etc., and the present invention is not considered limited to a particular peripheral geometry.

Also, pad support 116 can have an irregular peripheral geometry with respect to central opening 118 such that the radial relationship of pad support 116 to a work piece determines the height above the surface of a work piece, not shown, on which the elongated member 102 is supported.

Since other modifications are changes varied to fit particular operating conditions and environments or designs will be apparent to those skilled in the art, the invention is not considered limited to the examples chosen for 5 purposes of disclosure, and covers changes and modifications which do not constitute departures from the true scope of this invention.

Having thus described the invention, what is desired to 10 be protected by letters patents is presented in the subsequently appended claims.